

10/518884

In the claims:

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1. (Original) An isolated nucleic acid which comprises a hydroxycinnamoyl-CoA quinate hydroxycinnamoyl transferase (HQT) nucleotide sequence encoding a polypeptide which has HQT activity.
2. (Original) A nucleic acid according to claim 1 wherein the HQT nucleotide sequence is obtainable from tomato.
3. (Original) A nucleic acid according to claim 1 wherein the HQT nucleotide sequence is obtainable from tobacco.
4. (Original) A nucleic acid according to claim 2 wherein the HQT nucleotide sequence encodes a polypeptide with the amino acid sequence shown in SEQ ID No 1.
5. (Original) A nucleic acid according to claim 3 wherein the HQT nucleotide sequence encodes a polypeptide with the amino acid sequence shown in SEQ ID No 2.
6. (Original) A nucleic acid according to claim 5 wherein the HQT nucleotide sequence has the nucleotide sequence of SEQ ID No 3.
7. (Original) A nucleic acid according to claim 6 wherein the HQT nucleotide sequence has the nucleotide sequence of SEQ ID No 4.
8. (Currently amended) A nucleic acid comprising a hydroxycinnamoyl-CoA quinate hydroxycinnamoyl transferase (HQT) nucleotide sequence as claimed in claim 1 which is a homologous variant of SEQ ID No 3 or SEQ ID No 4 and which shares at least about 85%, 90%, 95%, 96%, 97%, 98% or 99% identity with either.

9. (Original) A nucleic acid according to claim 8 wherein said HQT nucleotide sequence encodes a polypeptide which has HQT activity.

10. (Currently amended) A nucleic acid according to claim 8 or claim 9 wherein the HQT nucleotide sequence is a derivative of SEQ ID No 3 or SEQ ID No 4 which differs therefrom by way of one or more of nucleotide addition, deletion or substitution, said nucleic acid optionally encoding a polypeptide having HQT activity.

11. (Currently amended) A nucleic acid which comprises a complement HQT nucleotide sequence sequence which is the complement of the HQT nucleotide sequence of ~~any one of claims~~ claim 1 to 10.

12. (Currently amended) An isolated nucleic acid for use as primer, said nucleic acid consisting of a sequence as claimed in claim 1, said primer being of about 16-32 nucleotides in length, which sequence is present in either the HQT nucleotide sequence encoding the polypeptide of claim 4 or claim 5, SEQ ID NO: 1 or SEQ ID NO: 2 or the complement thereof.

13. (Currently amended) An isolated nucleic acid for use as a probe, said nucleic acid consisting of a sequence as claimed in claim 1, said probe being of at least about 100 nucleotides or more, about 200 nucleotides or more, about 300 nucleotides or more, or about 400 nucleotides or more, which contiguous sequence is present in either the HQT nucleotide sequence of SEQ ID NO: 3 or SEQ ID NO: 4, claim 6 or claim 7 or the complement thereof.

14. (Currently amended) A method for identifying, cloning, or determining the presence of, a HQT encoding nucleic acid as

claimed in any of claims claim 1 to 9, which method employs a nucleic acid as claimed in any one of claims 6, 7, 11, 12 or 13 selected from the group consisting of SEQ ID NO: 3, SEQ ID NO: 4, a homologous variant of SEQ ID No 3 or SEQ ID No 4 and which shares at least about 85%, 90%, 95%, 96%, 97%, 98% or 99% identity with either, a nucleic acid encoding a polypeptide of SEQ ID NO: 1, a nucleic acid encoding a polypeptide of SEQ ID NO: 2, at least one primer of about 16-32 nucleotides in length, which sequence is present in the HQT nucleotide sequence encoding the polypeptide of SEQ ID NO: 1 or SEQ ID NO: 2 or the complement thereof, and a probe of at least about 100 nucleotides or more, about 200 nucleotides or more, about 300 nucleotides or more, or about 400 nucleotides or more, which contiguous sequence is present in either the HQT nucleotide sequence of SEQ ID NO: 3 or SEQ ID NO: 4, or the complement thereof.

15. (Currently amended) A method as claimed in claim 14 which comprises the steps of:

- (a) providing a preparation of nucleic acid from a plant cell;
- (b) providing said a nucleic acid molecule ~~which is a nucleic acid as claimed in any one claims 6, 7, 11, 12 or 13~~;
- (c) contacting nucleic acid in said preparation with said nucleic acid molecule under conditions for hybridisation, and,
- (d) identifying said HQT encoding a nucleic acid variant if present by its hybridisation with said nucleic acid molecule.

16. (Currently amended) A method as claimed in claim 14 15, which method comprises the steps of:

- (a) providing a preparation of nucleic acid from a plant cell;
- (b) providing a pair of nucleic acid molecule primers suitable for PCR, ~~at least one of said primers being a primer of claim 12~~
- (c) contacting nucleic acid in said preparation with said

primers under conditions for performance of PCR,
(d) performing PCR and determining the presence or absence of an amplified PCR product.

17. (Currently amended) A recombinant vector which comprises ~~the an HQT nucleic acid of any one of claims 1 to 11~~ said nucleic acid being selected from the group consisting of SEQ ID NO: 3, SEQ ID NO: 4, a nucleic acid encoding a polypeptide of SEQ ID NO: 1, a nucleic acid encoding a polypeptide of SEQ ID NO: 2, a homologous variant of SEQ ID No 3 or SEQ ID No 4 and which shares at least about 85%, 90%, 95%, 96%, 97%, 98% or 99% identity with either, at least one primer of about 16-32 nucleotides in length, which sequence is present in the HQT nucleotide sequence encoding the polypeptide of SEQ ID NO: 1 or SEQ ID NO: 2 or the complement thereof, and a probe of at least about 100 nucleotides or more, about 200 nucleotides or more, about 300 nucleotides or more, or about 400 nucleotides or more, which contiguous sequence is present in either the HQT nucleotide sequence of SEQ ID NO: 3 or SEQ ID NO: 4, or the complement thereof.

18. (Original) A vector as claimed in claim 17 wherein the nucleic acid is operably linked to a promoter for transcription in a host cell, wherein the promoter is optionally an inducible promoter.

19. (Currently amended) A vector as claimed in claim 17 ~~or claim 18 which is a plant vector, said vector optionally comprising a promoter sequence.~~

20. (Currently amended) A method which comprises the step of introducing the vector of ~~any one of claims~~ claim 17 to 19 into a host cell, and optionally causing or allowing recombination between the vector and the host cell genome such as to transform the host cell.

21. (Currently amended) A host cell containing or transformed with a heterologous nucleic acid of ~~any one of claims 1 to 11~~ ~~claim 1~~ such as to alter one or more of the cell's characteristics with respect to chlorogenic acid synthesis.

22. (Original) A host cell as claimed in claim 21 which is a plant cell, optionally present in a plant.

23. (Original) A method for producing a transgenic plant, which method comprises the steps of:

- performing a method as claimed in claim 20,
- regenerating a plant from the transformed plant cell.

24. (Currently amended) A transgenic plant which is obtainable by the method of claim 23, said transgenic plant comprising a plant cell comprising an HQT nucleic acid, or which is a clone, or selfed or hybrid progeny or other descendant of said transgenic plant, which in each case includes the plant cell of claim 22.

25. (Currently amended) A part of propagule from a plant as claimed in claim 24, ~~which includes the plant cell of claim 22.~~

26. (Currently amended) An isolated polypeptide which is encoded by the HQT nucleotide sequence of claim 1, said nucleic acid being selected from the group consisting of SEQ ID NO: 3 or SEQ ID NO: 4, a homologous variant of SEQ ID No 3 or SEQ ID No 4 and which shares at least about 85%, 90%, 95%, 96%, 97%, 98% or 99% identity with either, a nucleic acid encoding SEQ ID NO: 1, and a nucleic acid encoding SEQ ID NO: 2 ~~any one of claims 1 to 7, or claim 9.~~

27. A polypeptide as claimed in claim 26 comprising the

amino acid sequence of SEQ ID No 1.

28. A polypeptide as claimed in claim 26 comprising the amino acid sequence of SEQ ID No 2.

29. (Currently amended) A polypeptide which comprises the antigen-binding site of an antibody having specific binding affinity for a polypeptide encoded by the nucleic acid of claim 26 either the polypeptide of claim 27 or claim 28.

30. (Currently amended) A method of making the a polypeptide selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, a polypeptide encoded by SEQ ID NO: 3, a polypeptide encoded by SEQ ID NO: 4, a homologous variant of SEQ ID No 3 or SEQ ID No 4 and which shares at least about 85%, 90%, 95%, 96%, 97%, 98% or 99% identity with either of any of claims 26 to 28, which method comprises the step of causing or allowing expression from a nucleic acid of any one of claims 1 to 7 or claim 17 9 in a suitable host cell.

31. (Original) A method for influencing chlorogenic acid levels in a plant, which method comprises the step of causing or allowing expression of a heterologous nucleic acid within the cells of the plant, which nucleic acid comprises a HQT nucleotide sequence or the complement thereof, following an earlier step of introducing the nucleic acid into a cell of the plant or an ancestor thereof.

32. (Currently amended) A method according to claim 31, wherein the heterologous nucleic acid is a nucleic acid as claimed in claim 1. any one of claims 1 to 11.

33. (Original) A method according to claim 31, wherein the heterologous nucleic acid comprises the nucleotide sequence of NCBI accession number AB035183.

34. (Currently amended) A method as claimed in ~~any one of~~ claims 31 to 33 for increasing the level of chlorogenic acid in a plant to improve any one or more of: flavour; palatability; nutritional value; resistance to abiotic stress; pathogen resistance; antioxidant properties, of the plant, said heterologous nucleic acid being selected from the group consisting of SEQ ID NO: 3, SEQ ID NO: 4, the nucleotide sequence of NCBI accession number AB035183, a nucleic acid encoding a polypeptide of SEQ ID NO: 1, a nucleic acid encoding a polypeptide of SEQ ID NO: 2, a homologous variant of SEQ ID No 3 or SEQ ID No 4 and which shares at least about 85%, 90%, 95%, 96%, 97%, 98% or 99% identity with either.

35. (Currently amended) A method as claimed in claim 32 for reducing the level of chlorogenic acid in a plant to improve any one or more of: flavour; palatability; texture; nutritional value, of the plant, said method being selected from the group consisting of at least one which method comprises any of:

- (i) causing or allowing transcription from a nucleic acid which is a derivative of SEQ ID NO: 3 or SEQ ID NO: 4 having one or more nucleic acid additions, deletions or substitutions, as claimed in claim 10 in the plant such as to reduce HQT expression by an antisense mechanism, or
- (ii) causing or allowing transcription from a nucleic acid selected from the group consisting as claimed in any one of claims 1 to 9 SEQ ID NO: 3, SEQ ID NO: 4, the nucleotide sequence of NCBI accession number AB035183, a nucleic acid encoding a polypeptide of SEQ ID NO: 1, a nucleic acid encoding a polypeptide of SEQ ID NO: 2, a homologous variant of SEQ ID No 3 or SEQ ID No 4 and which shares at least about 85%, 90%, 95%, 96%, 97%, 98% or 99% identity with either.
or a part thereof such as to reduce HQT expression by co-suppression,

(iii) introducing into said plant use of a double-stranded RNA corresponding to a nucleotide sequence of step ii) an HQT nucleotide sequence of any one of claims 1 to 10, or,
(iv) introducing into said plant use of a nucleic acid encoding a ribozyme specific for a nucleic acid of step ii) as claimed in any one of claims 1 to 9.